



Public Service Company of New Hampshire Seacoast Reliability Project

Madbury, Durham, Newington & Portsmouth, NH

New Hampshire Department of Environmental Services Wetlands Permit Application SUPPLEMENT

Prepared For:
Public Service Company of New Hampshire
d/b/a Eversource Energy
780 North Commercial Street
Manchester, NH 03101

Submitted:
April 12, 2016
Supplement:
March 15, 2017

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Note: Items are numbered according to the NH DES "Wetlands Permit Application Required Information" document Revised 1-2016¹

1-3 NH DES Wetlands Permit Application Form

¹ <http://des.nh.gov/organization/divisions/water/wetlands/categories/forms.htm>



RSA/Rule: RSA 482-A/ Env-Wt 100-900

WETLANDS PERMIT APPLICATION

Land Resources Management

Wetlands Bureau

Check the status of your application: www.des.nh.gov/onestop



Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.:
			Check No.:
			Amount:
			Initials:

1. REVIEW TIME:
Indicate your Review Time below. Refer to Guidance Document A for instructions.

Standard Review (Minimum, Minor or Major Impact)
 Expedited Review (Minimum Impact only)

2. PROJECT LOCATION:
Separate applications must be filed with each municipality that jurisdictional impacts will occur in.

ADDRESS: Multiple - Linear Transmission Line ROW - See USGS Map(s)		TOWN/CITY: Multiple - See Maps	
TAX MAP: Multiple - See Att.	BLOCK:	LOT:	UNIT:
USGS TOPO MAP WATERBODY NAME: Multiple - See Mapping		<input type="checkbox"/> NA	STREAM WATERSHED SIZE: Various <input type="checkbox"/> NA
LOCATION COORDINATES (If known): 43 6'29.33"N, 70 52'35.96"W		<input checked="" type="checkbox"/> Latitude/Longitude <input type="checkbox"/> UTM <input type="checkbox"/> State	

3. PROJECT DESCRIPTION:
Provide a brief description of the project outlining the scope of work. Attach additional sheets as needed to provide a detailed explanation of your project. DO NOT reply "See Attached" in the space provided below.

The Seacoast Reliability Project proposes construction of a new 12.9 mile long 115-kilovolt transmission line within an existing distribution line ROW between the existing PSNH Madbury and Portsmouth substations. The project includes overhead and underground/submarine segments in Madbury, Durham, Newington and Portsmouth. This amended application includes new sections of underground and additional minor design changes.

4. SHORELINE FRONTAGE

NA This lot has no shoreline frontage.
 SHORELINE FRONTAGE: **240 LM within Project ROW**

Shoreline frontage is calculated by determining the average of the distances of the actual natural navigable shoreline frontage and a straight line drawn between the property lines, both of which are measured at the normal high water line.

5. RELATED PERMITS, ENFORCEMENT, EMERGENCY AUTHORIZATION, SHORELAND, ALTERATION OF TERRAIN, ETC.

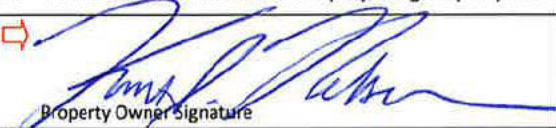
SEC App. for Cert. of Site and Facility, NHDES Shoreland, 401, AoT, & others. See SEC App for list.

6. NATURAL HERITAGE BUREAU & DESIGNATED RIVERS:
See the Instructions & Required Attachments document for instructions to complete a & b below.

a. Natural Heritage Bureau File ID: NHB 15 - 3561

b. Designated River the project is in ¼ miles of: Oyster River & Lamprey River Watershed; and date a copy of the application was sent to the Local River Management Advisory Committee: Month: 4 Day: 6 Year: 2016

NA

7. APPLICANT INFORMATION (Desired permit holder)			
LAST NAME, FIRST NAME, M.I.: Nelson, Kurt I.			
TRUST / COMPANY NAME: Public Service Company of New Hampshire d/b/a Eversource Energy, Inc.		MAILING ADDRESS: 13 Legends Dr.	
TOWN/CITY: Hooksett		STATE: NH	ZIP CODE: 03106
EMAIL or FAX: kurt.nelson@eversource.com		PHONE: 603-634-3256	
ELECTRONIC COMMUNICATION: By initialing here: KIN , I hereby authorize NHDES to communicate all matters relative to this application electronically			
8. PROPERTY OWNER INFORMATION (If different than applicant)			
LAST NAME, FIRST NAME, M.I.:			
TRUST / COMPANY NAME:		MAILING ADDRESS:	
TOWN/CITY:		STATE:	ZIP CODE:
EMAIL or FAX:		PHONE:	
ELECTRONIC COMMUNICATION: By initialing here _____, I hereby authorize NHDES to communicate all matters relative to this application electronically			
9. AUTHORIZED AGENT INFORMATION			
LAST NAME, FIRST NAME, M.I.: Allen, Sarah		COMPANY NAME: Normandeau Associates, Inc.	
MAILING ADDRESS: 25 Nashua Road			
TOWN/CITY: Bedford		STATE: NH	ZIP CODE: 03110
EMAIL or FAX: sallen@normandeau.com		PHONE: 603-637-1158	
ELECTRONIC COMMUNICATION: By initialing here SA , I hereby authorize NHDES to communicate all matters relative to this application electronically			
10. PROPERTY OWNER SIGNATURE:			
See the Instructions & Required Attachments document for clarification of the below statements			
By signing the application, I am certifying that:			
<ol style="list-style-type: none"> I authorize the applicant and/or agent indicated on this form to act in my behalf in the processing of this application, and to furnish upon request, supplemental information in support of this permit application. I have reviewed and submitted information & attachments outlined in the Instructions and Required Attachment document. All abutters have been identified in accordance with RSA 482-A:3, I and Env-Wt 100-900. I have read and provided the required information outlined in Env-Wt 302.04 for the applicable project type. I have read and understand Env-Wt 302.03 and have chosen the least impacting alternative. Any structure that I am proposing to repair/replace was either previously permitted by the Wetlands Bureau or would be considered grandfathered per Env-Wt 101.47. I have submitted a Request for Project Review (RPR) Form (www.nh.gov/nhdhr/review) to the NH State Historic Preservation Officer (SHPO) at the NH Division of Historical Resources to identify the presence of historical/ archeological resources while coordinating with the lead federal agency for NHPA 106 compliance. I authorize NHDES and the municipal conservation commission to inspect the site of the proposed project. I have reviewed the information being submitted and that to the best of my knowledge the information is true and accurate. I understand that the willful submission of falsified or misrepresented information to the New Hampshire Department of Environmental Services is a criminal act, which may result in legal action. I am aware that the work I am proposing may require additional state, local or federal permits which I am responsible for obtaining. 			
 Property Owner Signature		KURT I. NELSON Print name legibly	3/15/17 Date


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www.des.nh.gov

MUNICIPAL SIGNATURES

11. CONSERVATION COMMISSION SIGNATURE

The signature below certifies that the municipal conservation commission has reviewed this application, and:

1. Waives its right to intervene per RSA 482-A:11;
2. Believes that the application and submitted plans accurately represent the proposed project; and
3. Has no objection to permitting the proposed work.


	Print name legibly	Date
--	--------------------	------

DIRECTIONS FOR CONSERVATION COMMISSION

1. Expedited review **ONLY** requires that the conservation commission's signature is obtained in the space above.
2. Expedited review requires the Conservation Commission signature be obtained **prior** to the submittal of the original application to the Town/City Clerk for signature.
3. The Conservation Commission may refuse to sign. If the Conservation Commission does not sign this statement for any reason, the application is not eligible for expedited review and the application will reviewed in the standard review time frame.

12. TOWN / CITY CLERK SIGNATURE

As required by Chapter 482-A:3 (amended 2014), I hereby certify that the applicant has filed four application forms, four detailed plans, and four USGS location maps with the town/city indicated below.

 Town/City Clerk Signature	Print name legibly	Town/City	Date
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DIRECTIONS FOR TOWN/CITY CLERK:

Per RSA 482-A:3,I

1. For applications where "Expedited Review" is checked on page 1, if the Conservation Commission signature is not present, NHDES will accept the permit application, but it will NOT receive the expedited review time.
2. IMMEDIATELY sign the original application form and four copies in the signature space provided above;
3. Return the signed original application form and attachments to the applicant so that the applicant may submit the application form and attachments to NHDES by mail or hand delivery.
4. IMMEDIATELY distribute a copy of the application with one complete set of attachments to each of the following bodies: the municipal Conservation Commission, the local governing body (Board of Selectmen or Town/City Council), and the Planning Board; and
5. Retain one copy of the application form and one complete set of attachments and make them reasonably accessible for public review.

DIRECTIONS FOR APPLICANT:

1. Submit the single, original permit application form bearing the signature of the Town/ City Clerk, additional materials, and the application fee to NHDES by mail or hand delivery.

13. IMPACT AREA:

For each jurisdictional area that will be/has been impacted, provide square feet and, if applicable, linear feet of impact

Permanent: impacts that will remain after the project is complete.

Temporary: impacts not intended to remain (and will be restored to pre-construction conditions) after the project is complete

JURISDICTIONAL AREA	PERMANENT Sq. Ft. / Lin. Ft.		TEMPORARY Sq. Ft. / Lin. Ft.	
Forested wetland	26	<input type="checkbox"/> ATF	4514	<input type="checkbox"/> ATF
Scrub-shrub wetland	511	<input type="checkbox"/> ATF	238443	<input type="checkbox"/> ATF
Emergent wetland	204	<input type="checkbox"/> ATF	43108	<input type="checkbox"/> ATF
Wet meadow	37	<input type="checkbox"/> ATF	20566	<input type="checkbox"/> ATF
Intermittent stream	0	<input type="checkbox"/> ATF	0	<input type="checkbox"/> ATF
Perennial Stream / River	0 / 0	<input type="checkbox"/> ATF	523 / 176	<input type="checkbox"/> ATF
Lake / Pond	0 / 0	<input type="checkbox"/> ATF	0 / 0	<input type="checkbox"/> ATF
Bank - Intermittent stream	0 / 0	<input type="checkbox"/> ATF	0 / 0	<input type="checkbox"/> ATF
Bank - Perennial stream / River	0 / 0	<input type="checkbox"/> ATF	see above / 352	<input type="checkbox"/> ATF
Bank - Lake / Pond	0 / 0	<input type="checkbox"/> ATF	0 / 0	<input type="checkbox"/> ATF
Tidal water	5336 / n/a	<input type="checkbox"/> ATF	271984 / n/a	<input type="checkbox"/> ATF
Salt marsh	0	<input type="checkbox"/> ATF	1222	<input type="checkbox"/> ATF
Sand dune	0	<input type="checkbox"/> ATF	0	<input type="checkbox"/> ATF
Prime wetland	31	<input type="checkbox"/> ATF	34976	<input type="checkbox"/> ATF
Prime wetland buffer	n/a	<input type="checkbox"/> ATF	n/a	<input type="checkbox"/> ATF
Undeveloped Tidal Buffer Zone (TBZ)	0	<input type="checkbox"/> ATF	0	<input type="checkbox"/> ATF
Previously-developed upland in TBZ	11	<input type="checkbox"/> ATF	21166	<input type="checkbox"/> ATF
Docking - Lake / Pond	n/a	<input type="checkbox"/> ATF	n/a	<input type="checkbox"/> ATF
Docking - River	n/a	<input type="checkbox"/> ATF	n/a	<input type="checkbox"/> ATF
Docking - Tidal Water	n/a	<input type="checkbox"/> ATF	n/a	<input type="checkbox"/> ATF
TOTAL	6156 / 0		636502 / 528	

14. APPLICATION FEE: See the Instructions & Required Attachments document for further instruction

Minimum Impact Fee: Flat fee of \$ 200

Minor or Major Impact Fee: Calculate using the below table below

Permanent and Temporary (non-docking) 642,658 sq. ft. X \$0.20 = \$ 128,531.60

Temporary (seasonal) docking structure: _____ sq. ft. X \$1.00 = \$ _____

Permanent docking structure: _____ sq. ft. X \$2.00 = \$ _____

Projects proposing shoreline structures (including docks) add \$200 = \$ n/a

Total = \$ 128,531.60

The Application Fee is the above calculated Total or \$200, whichever is greater = \$ 128,531.60

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5. Statements in Response to the 20 Questions (Env-
Wt 302.04)

WETLANDS PERMIT APPLICATION – ATTACHMENT A MINOR AND MAJOR - 20 QUESTIONS

Water Division/ Wetlands Bureau/ Land Resources Management
Check the Status of your application: www.des.nh.gov/onestop



RSA/ Rule: RSA 482-A, Env-Wt 100-900

Env-Wt 302.04 Requirements for Application Evaluation - For any major or minor project, the applicant shall demonstrate by plan and example that the following factors have been considered in the project's design in assessing the impact of the proposed project to areas and environments under the department's jurisdiction. Respond with statements demonstrating:

1. The need for the proposed impact.

Unchanged from original Application

2. That the alternative proposed by the applicant is the one with the least impact to wetlands or surface waters on site.

Unchanged from original Application

3. The type and classification of the wetlands involved.
<p>Unchanged from original Application</p>
4. The relationship of the proposed wetlands to be impacted relative to nearby wetlands and surface waters.
<p>Unchanged from original Application</p>
5. The rarity of the wetland, surface water, sand dunes, or tidal buffer zone area.
<p>Unchanged from original Application</p>
6. The surface area of the wetlands that will be impacted.
<p>A total of 6,114 SF (0.14 acres) of permanent wetland impacts are proposed as a part of the Project; these impacts are unavoidable and have been minimized as much as possible. A total of 579,837 SF (13.31 acres) of wetlands are proposed to be temporarily impacted during clearing and construction activities. Permanent impacts are associated with the installation of new transmission line structures in terrestrial areas and the potential need for concrete mattresses for cable protection in estuarine areas. Temporary impacts are associated with timber matting along access roads and for work pads and for impacts associated with installation the underground sections of the line (UNH and Frink Farm area) and installation of the marine cables using jetplow and hand-jetting technology.</p>

7. The impact on plants, fish and wildlife including, but not limited to:
 - a. Rare, special concern species;
 - b. State and federally listed threatened and endangered species;
 - c. Species at the extremities of their ranges;
 - d. Migratory fish and wildlife;
 - e. Exemplary natural communities identified by the DRED-NHB; and
 - f. Vernal pools.

According to data Normandeau received from NHHB in 2013, 2014 and 2015 (Appendix A), NHB identified 9 plants, 6 exemplary communities, 1 invertebrate, 5 fish populations, 4 reptiles, 9 bird species, and 2 mammals that have occurred or currently occur within the vicinity of the project area. The results of field surveys and desktop analyses indicate that the Project corridor may provide habitat for 4 natural communities (Sparsely vegetated intertidal system and Subtidal system, High salt marsh, Salt marsh system), 1 invertebrate (Ringed boghaunter), 5 fish (Shortnose Sturgeon, Atlantic Sturgeon, American Eel, Banded Sunfish, Swamp Darter), 4 reptiles (Eastern Hog-nose Snake, Northern Black Racer, Blandings and Spotted Turtles), 2 birds (Bald Eagle, Osprey) and 2 mammals (Northern Long-eared bat, New England Cottontail). One plant species, crested sedge, was found in Durham.

In general, impacts to protected species will be managed through best management practices during construction. Examples include pre-construction surveys to ensure the absence of nesting bald eagles and osprey (if either species is breeding within or near the ROW, time-of-year restrictions may apply); surveys during construction to clear the work area of turtles and snakes; handcutting in the vicinity of the ringed boghaunter habitat in the unlikely case that larvae use the marginal habitat in the ROW; and minimization of clearing preferred shrubby areas in high priority New England cottontail habitat. Impacts to northern long-eared bats, assumed to occur in the project corridor, will be small and inconsequential to local and regional populations . Approximately 0.02 acres of unavoidable temporary impacts to the fringing salt marsh will be restored following burial of the cable. Restoration techniques will include salvaging the intact peat prior to trenching for replacement after the cables are buried. A portion of one wetland has been classified as a vernal pool but will not be directly impacted.

8. The impact of the proposed project on public commerce, navigation and recreation.

Unchanged from original Application

9. The extent to which a project interferes with the aesthetic interests of the general public. For example, where an applicant proposes the construction of a retaining wall on the bank of a lake, the applicant shall be required to indicate the type of material to be used and the effect of the construction of the wall on the view of other users of the lake.

The amended Visual Assessment (“VA”) concluded that the Project will not have an unreasonable adverse effect on aesthetics. Before filing its application, PSNH held multiple meetings with each host community as well as representatives of the University of New Hampshire. As a result, PSNH incorporated, and is continuing to incorporate, design elements that reduce visual impacts, including: burial of two additional sections of line in Newington at the Newington Center Historic District and the Flynn Pit; relocating distribution lines, where possible, in order to reduce transmission line structure heights; replacement of the 90-115-foot double circuit monopoles in Newington with H-Frame structures that range between 60 and 70 feet by removing the existing 34.5 kV distribution line from the proposed underbuild; and working with individual property owners to shift structure locations, where possible. The co-location of the Project within an existing electric corridor significantly reduces the visual impact of the Project as these areas are already disturbed. The use of the existing corridor will help to reduce the disruption to land uses and minimizes the amount of new clearing required. The lack of highly sensitive areas, coupled with the existing development patterns, limits the impact of the SRP to visual resources.

10. The extent to which a project interferes with or obstructs public rights of passage or access. For example, where the applicant proposes to construct a dock in a narrow channel, the applicant shall be required to document the extent to which the dock would block or interfere with the passage through this area.

Unchanged from original Application

11. The impact upon abutting owners pursuant to RSA 482-A:11, II. For example, if an applicant is proposing to rip-rap a stream, the applicant shall be required to document the effect of such work on upstream and downstream abutting properties.

Unchanged from original Application

12. The benefit of a project to the health, safety, and well being of the general public.

Unchanged from original Application

13. The impact of a proposed project on quantity or quality of surface and ground water. For example, where an applicant proposes to fill wetlands the applicant shall be required to document the impact of the proposed fill on the amount of drainage entering the site versus the amount of drainage exiting the site and the difference in the quality of water entering and exiting the site.

There will be no change in the quantity of surface water or groundwater as it currently enters and leaves the project corridor. Best management practices (BMPs) (New Hampshire Department of Resources and Economic Development 2010) will be employed to avoid temporary impacts to water quality during construction activity and these measures will be installed prior to construction, maintained throughout the work, and removed when applicable following the end of the project. Disturbed areas will be restored based on BMPs and agency recommendations. Construction of the marine portion of the Project has been designed to minimize the temporary impacts to water quality to the maximum extent practicable. Water quality changes related to the installation of cables within Little Bay will be minimized through advanced technology (jet plow), utilization of controls such as sediment curtains, and restricting work to coincide with favorable tidal conditions. Any changes in water quality from suspended sediment will be brief in duration and limited in scope. A water quality monitoring program is proposed to measure turbidity during construction. The project is coordinating with NHDES and USEPA to develop a management strategy for PFOA/S contaminated soils and groundwater in construction areas.

14. The potential of a proposed project to cause or increase flooding, erosion, or sedimentation.

Unchanged from original Application

15. The extent to which a project that is located in surface waters reflects or redirects current or wave energy which might cause damage or hazards.

Proposed work in surface waters will be temporary in nature and associated with temporary access across terrestrial wetlands to the work sites located along the existing ROW. The majority of small streams will be temporarily bridged with timber matting and temporary culverts are necessary in only two areas. Two perennial streams (College Brook near UNH; and unnamed trib. at Frink Farm) are proposed to be crossed by an underground portion of the line via open trench. To accommodate the temporary installations of the line through these areas, temporary diversions will be needed so the work can be done under dry conditions within the stream. Following installation the streambed and banks will be restored to pre-existing conditions and stabilized and the temporary diversion of surface water will be removed. These terrestrial wetlands do not contain any currents or wave energy.

The Little Bay crossing will be located underground and/or as submarine cable installed via using jetplowing, along with hand-jetting and trenching in the nearshore areas. Concrete mattresses will be required where the cable cannot be buried to the specified depth to provide protection from anthropogenic and environmental disturbances. The mattresses are articulated and low-profile and are not anticipated to reflect or redirect wave or current energy.

Therefore this project will not permanently reflect or redirect current or wave energy as the areas will be restored to pre-construction grade.

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16. The cumulative impact that would result if all parties owning or abutting a portion of the affected wetland or wetland complex were also permitted alterations to the wetland proportional to the extent of their property rights. For example, an applicant who owns only a portion of a wetland shall document the applicant's percentage of ownership of that wetland and the percentage of that ownership that would be impacted.

This project serves the public, including the local landowners, and is therefore not directly comparable to an individual land-owner's desire to fill wetlands for private use. Nonetheless, permanent wetland impacts associated with the terrestrial portions of the project will be minimal (approx. 778 SF), and these permanent impacts are spread out over 24 separate wetlands in three towns: Madbury, Durham, and Newington. No permanent impacts are proposed within the City of Portsmouth. The largest permanent terrestrial impact in any wetland is 199 SF, which will occur in wetland MW2 in Madbury. Proposed permanent impacts to the estuarine portions of the Project will not exceed 5,336 SF, and may be less. These impacts have been minimized where possible and are associated with required protection measures where the submarine cable cannot be buried to a sufficient depth. The estuarine intertidal flats and submarine wetlands proposed to be impacted extend throughout the Little Bay area. Impacts are restricted to an existing cable crossing corridor which has been utilized in the past and contains de-energized cables that are obsolete. Overall, the potential cumulative impacts will be minimal due to the limited amount of terrestrial permanent impacts and regulatory restrictions associated with estuarine impacts outside of the existing cable crossing area.

17. The impact of the proposed project on the values and functions of the total wetland or wetland complex.

Permanent impacts to terrestrial wetlands are minor (778 SF) and have been avoided or minimized where possible. Temporary impacts are not anticipated to have any adverse effect on the functions and values associated with the affected wetland systems. Applicable construction BMPs, on-site monitoring, and restoration of temporarily impacted areas according to standards and based on agency recommendations will be employed. The functions most commonly associated with the permanently impacted terrestrial wetlands include groundwater discharge, floodflow alteration, production export, sediment/toxicant retention and wildlife habitat; however the small footprint of new transmission line structures will not affect these wetland functions or those associated with the wetland complex.

Permanent impacts to the estuarine wetlands associated with Little Bay have also been avoided and minimized where possible, and are limited to surficial protection measures (concrete mattresses) that are required by the National Electrical Safety Code (NESC) for submarine cables that cannot be buried to the required depth due to bedrock or other limiting material. Impacts will be restricted to the existing cable crossing area and are not anticipated to result in any undue adverse impacts to wetland functions and values.

Additional information is included in the permit application narrative and associated NH SEC application materials.

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18. The impact upon the value of the sites included in the latest published edition of the National Register of Natural Landmarks, or sites eligible for such publication.

Unchanged from original Application

19. The impact upon the value of areas named in acts of congress or presidential proclamations as national rivers, national wilderness areas, national lakeshores, and such areas as may be established under federal, state, or municipal laws for similar and related purposes such as estuarine and marine sanctuaries.

Unchanged from original Application

20. The degree to which a project redirects water from one watershed to another.

Unchanged from original Application

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Additional comments

None. Please refer to the project narrative, appendices and plans for additional details.

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6. The Seacoast Reliability Project: Project Description & Existing Conditions Narrative

Primary Project Overview

Based on the design modifications, certain descriptions of the Overhead Transmission Line must be revised, which are outlined below. In addition, there are now three terrestrial sections of the new 115 kV line that will be constructed underground with three solid dielectric insulated cables installed in individual PE conduits. See Appendix 5(a) in the SEC application for Amended Engineering Design Drawings.

Timber Brook Lane to Durham Point Road: Structures 64 to 94

As part of the amendment, this section as described in the original application now only applies to Structures 64 to 91. All other details as described in this section remain as described in the original application.

Durham Point Road Crossing: Structures 94 to 96

Based on the Project design, the description of the Overhead Portion of the Project in this section now applies from Structures 91 to 96. All other details remain as described in the original application.

Little Bay Crossing to Little Bay Road: Underground Cable

As part of this amendment, this segment of the Project will be installed as an underground cable in a buried duct bank consisting of PE and PVC conduits. This segment will begin at a new precast concrete manhole located in the corridor on the eastern side of Little Bay in Newington and will proceed approximately 360 feet easterly to Gundalow Landing Circle in Newington. The underground segment will continue approximately 1,000 feet along Gundalow Landing Circle within the public ROW and within new easements across private and town property to three self-supported steel transition structures located approximately 440 feet off Little Bay Road. The total length of the underground segment is approximately 1,800 feet. The transition structures will be approximately 65 feet in height and will have the cable terminations and surge arresters located on davit arms in a horizontal configuration.

The proposed underground transmission line will consist of three solid dielectric insulated cables installed in individual PE conduits. The nominal trench for the duct bank will be five (5) feet wide by five (5) to eight (8) feet deep. The duct bank will consist of four 8-inch diameter PE conduits, two 4-inch diameter PVC conduits for fiber-optic communication to protect the transmission lines and one 2-inch diameter PVC conduit for a ground cable. The conduits will be directly buried with a minimum of 30 inches of cover. Due to the more delicate nature of fiber optic cable the allowable pulling lengths may not match the underground power cable. As

a result handholes, which are approximately 5 feet wide by 7 feet long, may be placed approximately every 600 feet along the underground route.

Little Bay Road to Fox Point Road: Structures 102 to 115

As part of this Amendment, this section in the original WPA application shall be substituted with the following description:

a. **Little Bay Road to Frink Farm and the Newington Center Historic District: Structures 102 to 109**

This section of the Project will be constructed within existing PSNH electric utility easements and will consist only of the new 115 kV overhead transmission line. The new transmission centerline will be located in the center of an approximately 100 foot wide corridor. The structures along this portion of the Project will be direct embedded monopole, tubular self-weathering steel with some multi-pole horizontal configuration structures. Span lengths will average approximately 470 feet. The existing 34.5kV line will be removed in this section of the corridor. Some of the new 115 kV overhead line conductors will be in a delta phasing configuration on steel davit arms with suspension insulators. Others structures will utilize multi-pole horizontal configurations with the conductor attached directly to the pole or on a horizontal crossarm with suspension insulators. Shield wires will be attached directly to the structures at the poles or on steel davit arms. Structure heights will vary between approximately 65 feet and 80 feet above grade.

b. **Newington Historic District to East Side of Nimble Hill Road and Hannah Lane Neighborhood (Structure 113): Underground Cable**

This segment of the Project will be installed as an underground cable in a buried duct bank consisting of PE and PVC conduits. The underground segment will be constructed within existing ROW crossing under Nimble Hill Road to three self-supported steel transition structures located approximately 1,200 feet off Nimble Hill Road. The total length of the underground segment is approximately 2,680 feet. The transition structures will be approximately 65 feet in height and will have the cable terminations and surge arresters located on davit arms in a horizontal configuration. The existing 34.5kV line will be removed in this section of the corridor.

The proposed underground transmission line will consist of three solid dielectric insulated cables installed in individual PE conduits. The nominal trench for the duct bank will be five (5) feet wide by five (5) to eight (8) feet deep. The duct bank will consist of four 8-inch diameter PE conduits, two 4-inch diameter PVC conduits for fiber-optic communication to protect the transmission lines and one 2-inch diameter PVC conduit for a ground cable. The conduits will be directly buried with a minimum of 30 inches of cover. Due to the more delicate nature of fiber optic cable the allowable pulling lengths cannot match the underground power cable. As a result handholes, which are approximately 5 feet wide by 7 feet long, may be placed approximately every 600 feet along the underground route.

c. East Side of Nimble Hill Road to Fox Point Road: Structures 113 to 115

This section of the Project will be constructed within existing PSNH electric utility easements and will consist only of the new 115 kV overhead transmission line. The new transmission centerline will be located in the center of an approximately 100 foot wide corridor. The structures along this portion of the Project will be direct embedded monopole, tubular self-weathering steel structures. The running angle and dead end structures will require the installation of guy wires or reinforced concrete drilled pier foundations to support the applied loads. Span lengths will average approximately 413 feet. The existing 34.5kV line will be removed in this section of the corridor. Some of the new 115 kV overhead line conductors will be in a delta phasing configuration on steel davit arms with suspension insulators. Shield wires will be attached directly to the structures at the poles or on steel davit arms. Structure heights will vary between approximately 80 feet and 84 feet above grade.

Description of General Environmental Setting

Vernal Pools

Continuing field studies of a water resource in the Newington Town Forest, locally referred to as the Flynn Pit, resulted in a recommended change in its classification from a permanent pond to a vernal pool. The findings during the field studies that support the reclassification are provided below.

The SRP corridor was surveyed for potential vernal pools during wetland delineations. Each potential vernal pool encountered was visually inspected for egg masses and/or larvae of amphibian vernal pool indicator species during the spring 2014 vernal pool species breeding season. A follow-up review of specific areas was also conducted in the spring of 2015 and throughout 2016. A dip net was also used to survey for amphibian larvae and invertebrates. Vernal pools were identified in accordance with the NHDES Wetland Rules (Env-Wt) 101.106 and Env-Wt 301.01, and procedures described in *Identification and Documentation of Vernal Pools in New Hampshire*, published by the New Hampshire Fish and Game Department (NHFG 2004).

During the initial wetland and stream delineation in the summer and fall of 2013, two potential vernal pools (PVPs) were identified. A follow-up survey was conducted in the spring of 2014, during the appropriate season for confirming vernal pool characteristics, to identify any other active vernal pools and to verify the previously identified PVPs, neither of which met the definition of vernal pool habitat. Another vernal pool review was conducted in the spring of 2015 found a primary vernal pool indicator (wood frogs, *Rana sylvatica*) utilizing a portion of the Flynn Pit, a permanently inundated pond surrounded by a forested wetland (NW 4). It used to be maintained as a skating pond and still has a small warming hut. The pond did not meet the definition of a vernal pool because of its permanent hydrology.

In 2016, a wetland scientist for the Town of Newington informed us of his observations of fairy shrimp (presumably the common fairy shrimp *Eubbranchipus vernalis*) in the Flynn Pit pond. Fairy shrimp are considered a primary indicator species of vernal pools in NH. He described

them as abundant in the pool, and also described wood frog and spotted salamander (*Ambystoma maculata*) egg masses. Normandeau revisited the pond multiple times in 2016. On April 29, we recorded abundant fairy shrimp and 14 mature blue spotted salamander (*Ambystoma laterale*) egg masses. No wood frog egg masses or larvae, or fish were observed. We also recorded 2 adult green frogs (*Rana clamitans*) and 2 second-year green frog larvae. By May 11, the fairy shrimp and the blue spotted salamander egg masses were gone, and we did not record any blue spotted or other vernal pool larvae during 50 dip nets in a variety of habitats around the pool. We observed over 100 second-year green frog larvae, as well as leeches and many log-cabin caddisfly larvae. Water levels in both April and May ranged from very shallow along the edge to approximately 30 inches in the center. Normandeau has revisited the pond several more times (June 8, July 8, July 21, August 11 and August 19, 2016), and found water in the pond through August 11, even in this time of severe drought, as designated for the NH Seacoast Region by both DES and US Department of Agriculture². On the June and early July dates, surface water extended to almost the full pool line. In late July the water had drawn down to the center (an estimated 18 inches deep) and the perimeter was exposed, but for a few isolated pools. On August 11, the center pool was very reduced in size and depth. By August 19, the center pool was dry.

Our conclusion is that the pond has a largely permanent hydrology in the center, given this year of severe drought and late drying. However, the pond appears to provide sufficient drawdown in many years along the edges to expose fairy shrimp eggs to drying, which is a necessary part of their life cycle. Fairy shrimp eggs can persist in the substrate for multiple years, and await suitable conditions before hatching. The lack of wood frog and blue spotted larvae during sampling suggest that few survive to metamorphosis. The abundance of second-year green frog larvae and leeches indicates that permanent water persists in most years in a portion of the pond. The vegetation of the pond also reflects a range of hydrologic conditions, with buttonbush (*Cephalanthus occidentalis*) dominating the edges and narrow-leaf burreed (*Sparganium angustifolium*) and duckweed (*Lemna minor*) surrounding the open water in the center of the pond. A variety of sedges and grasses occur in the drawdown zone.

This water body appears to function as both a permanent pond and a vernal pool, supporting primary indicators of vernal pools (fairy shrimp, wood frogs and blue spotted salamanders), and permanent pond species (green frog larvae and leeches). Fairy shrimp can complete their life cycle in the early spring, before the typical pond predators are fully active. Although it may act as an ecological sink for wood frogs and blue-spotted salamanders in most years, sufficient larvae appear to succeed in metamorphosing to adults to maintain a breeding population. Because of the presence of three vernal pool indicator species and the lack of fish, Normandeau is considering the pond a vernal pool for regulatory purposes, but recognizes its dual

² <http://droughtmonitor.unl.edu/Home/StateDroughtMonitor.aspx?NH;>
<http://des.nh.gov/organization/divisions/water/dam/drought/documents/droughtstatus.pdf>

functionality as both a vernal pool and a permanent pond. The functional value of the pond is only moderate because its vernal pool functions are limited by its mostly permanent hydrology, and its permanent pond functions are limited because it occasionally dries up.

Potential Project Impacts and Avoidance and Minimization Measures

Impact Avoidance

Within the proposed route, permanent and temporary impacts to water resources were avoided where possible throughout the design and engineering phases of project development. Multiple rounds of preliminary design reviews were conducted between project engineering and environmental specialists. New structures were located outside of wetlands, unless technical constraints pertaining to project corridor limitations, structure height and maximum spans dictated that a structure be placed in a wetland resource. In the final design, 26 new structures, of the 180 proposed new or relocated will be located within or partially within wetland areas and will result in permanent impacts.

Access routes and temporary work pads for construction were similarly reviewed and wetland crossings were avoided where possible. The required tree clearing along the edges of the existing corridor limited the amount of wetland avoidance; however other methods such as clearing during winter/frozen-ground conditions and hand cutting may be employed to minimize temporary impacts associated with these activities (see below).

Impact Minimization

Engineering constraints limited the ability to avoid placing 26 new structures within or partially within wetland areas, thus wetlands have been avoided by approximately 85 percent of the 179 proposed new or relocated structures. Additionally, it should be noted that approximately 51 existing distribution structures will be removed from wetland areas by utilizing double circuit designs where necessary. The existing distribution line will be co-located on the same new structures below the new transmission lines. This will result in the net decrease of 25 structures within wetland areas.

Impact Analysis

Unavoidable direct and secondary impacts to water resources and associated upland buffer areas were reviewed throughout the Project area. Direct impacts include permanent and temporary disturbances, as discussed above (See Table 1). Secondary impacts were also reviewed, including forested wetland conversion and upland clearing within perennial and intermittent stream buffers. Forested wetland conversion will occur where forested wetland areas within the SRP corridor are cleared to allow for the safe construction and operation of the proposed transmission line. Temporary direct impacts from timber matting to allow for mechanized clearing and construction of the transmission line will be necessary in these areas.

These areas will not be stumped or grubbed and soil disturbance will be minimal. The forested wetlands will naturally convert to emergent or scrub-shrub resources following the clearing activities. Upland stream buffer tree removal within 100 feet of perennial streams, 50 feet of intermittent streams, and 25 feet of ephemeral streams was also quantified.

Expected Impact Types

Direct Permanent Impacts

Direct permanent impacts will result from the placement of new and relocated structures, their associated foundations, and caissons; and other permanent fill consisting of concrete mattresses in jurisdictional resource areas within Little Bay.

Direct Temporary Impacts

Direct temporary impacts will result from the placement of temporary construction mats, or timber mats for access and construction activities, temporary mat bridges and culverts for stream crossings, and temporary work pads for installing the structures. Direct temporary impacts will also result where the underground portions of the line are installed in trenches through jurisdictional natural resources. Conducting work during frozen or dry conditions will also help to minimize disturbances to wetlands and streams. Where winter construction is not possible, access across wetlands and streams will employ timber mats or other approved BMPs. All access roads across wetlands and streams will be temporary and designed to minimize impacts and surface water disturbance.

Secondary Impacts

Based on pre-application meetings with the federal regulatory agencies, secondary wetland and stream impacts for the Project will include the conversion of forested wetlands to scrub-shrub or emergent wetlands through tree clearing and clearing of upland forest within 100 feet of perennial streams, 50 feet of intermittent streams, 25 feet of ephemeral streams.

For calculating the amount of secondary impacts that must be compensated for in the mitigation package, the following guidance was provided by the federal agencies:

- 15% of forested wetland conversion in existing ROW
- 15% of upland stream buffers in existing ROW

Table 1. Summary of total proposed direct permanent and temporary wetland impacts by town.

<i>Town</i>	Permanent (SF)	Temporary (SF)	Total (SF)
<i>Madbury</i>	199	29,261	29,460
<i>Durham</i>	3,753	319,124	322,877
<i>Newington</i>	2,162	231,452	233,614
<i>Portsmouth</i>	0	0	0
Total (Sq. Ft.):	6,114	579,837	585,951
Total (Acres):	0.14	13.31	13.45

The resulting quantities for secondary impacts are added to the direct permanent impacts, and this represents the wetland impacts that must be compensated for at the specified federal mitigation ratios.

Direct Wetland Impact

Direct permanent and temporary wetland impacts associated with the SRP total 6,114 SF (0.14 acres) and 579,837 SF (13.31 acres), respectively. The breakdown of impacts by town and Cowardin cover class associated with the SRP is summarized in Table 2. The SRP will impact greater than 20,000 square feet of non-tidal wetland and intersects with potential habitat for wetland-dependent threatened and endangered species. It is therefore classified as a Major project in accordance with Env-Wt 303.02(c) and Env-Wt 303.02(h).

A detailed summary table of wetland impacts, wetland classification and functions/values is attached (see Appendix B) along with additional information from the Natural Resources Existing Conditions Report (see Appendix A). The following is an overview of the wetlands proposed to be impacted during the project.

Table 2. Proposed wetland impacts by cover class and town

	# Wetlands	Permanent Impact (SF)	Temporary Impact (SF)	Total (SF)
Madbury				
PEM/PSS	1	199	28,940	29,139
PSS	1	0	321	321
<i>Sub-Total:</i>	2	199	29,261	29,460
Durham				
E1UB (Subtidal)	1	0	49,832	49,832
E2US (Mud Flat)	1	3,550	114,166	117,716
E2EM (Salt Marsh)	1	0	624	624
E2RS (Rocky Shore)	1	0	279	279
PEM (Emergent/Marsh)	5	71	25,632	25,703

**SEACOAST RELIABILITY PROJECT
NHDES WETLANDS PERMIT APPLICATION - SUPPLEMENT**

	# Wetlands	Permanent Impact (SF)	Temporary Impact (SF)	Total (SF)
PEM/PSS	23	49	71,739	71,788
PEM/PSS/PFO	1	0	807	807
PEM/PSS/PUB	1	20	18,175	18,195
PEM (Wet Meadow)	8	17	7,502	7,519
PFO	3	26	4,514	4,540
PSS	11	20	16,366	16,386
PSS/PFO	4		9,488	9,488
Sub-Total:	60	3,753	319,124	322,877
Newington				
E1UB (Subtidal)	1	0	77,565	77,565
E2US (Mud Flat)	1	1,484	29,925	31,409
E2EM (Salt Marsh)	1	0	598	598
E2RS (Rocky Shore)	1	302	217	519
PEM (Emergent/Marsh)	2	133	16,500	16,633
PEM/PSS	8	192	62,614	62,806
PEM/PSS/PFO	3	0	9,718	9,718
PEM/PUB	2	0	976	976
PEM (Wet Meadow)	6	20	13,064	13,084
PSS	3	20	8,854	8,874
PSS/PFO	2	0	4,957	4,957
PSS/PUB	1	11	6,464	6,475
Sub-Total:	31	2,162	231,452	233,614
Portsmouth				
	0	<i>No Impacts</i>		
Sub-Total:	0	0	0	0
Total:	SF	6,114	579,837	585,951
	Acres	0.14	13.31	13.45

Madbury

Two wetlands (MW1/MW2) will be impacted in Madbury, totaling 199 SF (0.005 acres) of permanent and 29,261 SF (0.672 acres) of temporary disturbance. Permanent impacts are associated with new structures and temporary impacts are associated with access roads, work pads and areas needed for “pulling” the new conductors. These wetlands are located near the existing PSNH Madbury Substation and numerous transmission lines and also parallel a railroad corridor. Wetland MW1 is predominantly a PSS wetland and MW2 is a combination of PEM and PSS cover types.

Durham

Sixty (60) wetlands will be impacted in Durham, totaling 3,753 SF (0.09 acres) of permanent and 319,124 SF (7.33 acres) of temporary impacts. Permanent impacts are associated with new structures and concrete mattresses and temporary impacts are associated with access roads for construction and tree clearing, trenched areas where the line will be installed underground, work pads and work areas needed for “pulling” the new conductors. Temporary impacts are also associated with the intertidal and subtidal areas of Little Bay which will be crossed via submarine cable. The new transmission line will be installed via trench and jetplow depending on the location and substrate. These areas will be returned to the original grade following construction and restored where applicable.

The majority (80%) of the permanently impacted terrestrial wetlands are PEM/PSS wetlands, wet meadow wetlands (PEM), or scrub-shrub (PSS) wetlands. The remaining wetlands are other combinations of cover types including small area of forested and unconsolidated bottom features. The permanent impacts to estuarine wetlands are limited to the potential need to place concrete mattresses for cable protection in areas of intertidal mudflats (E2US) and a small amount of intertidal rocky shore (E2RS). Subtidal unconsolidated bottom (E1UB) wetland in Little Bay will also be temporarily impacted during the installation of the submarine cable along with small areas of intertidal wetlands, including salt marsh (E2EM), intertidal rocky shore (E2RS) and areas of intertidal mudflats (E2US).

Newington

Thirty-one (31) wetlands will be impacted in Newington, totaling 2,162 SF (0.05 acres) of permanent and 231,452 SF (5.31 acres) of temporary impacts. Permanent impacts are associated with new structures on land and concrete mattresses in Little Bay. Temporary impacts are associated with access roads for construction and tree clearing, trenched areas where the line will be installed underground, work pads and areas needed for “pulling” the new conductors. Temporary impacts are also associated with the intertidal and subtidal areas of Little Bay which will be crossed via submarine cable (see description, above).

As with Durham, the majority (98%) of the permanently impacted terrestrial wetlands are PEM/PSS wetlands, wet meadow wetlands (PEM), or scrub-shrub (PSS) wetlands and the remaining wetlands are combinations of cover types including wetlands with small areas of forested cover along the edges of the ROW. Subtidal unconsolidated bottom (E1UB) wetlands in Little Bay will also be temporarily impacted during the installation of the submarine cable. Additionally, small areas intertidal rocky shore (E2RS) and mudflats (E2US) will also be permanently and temporarily impacted.

Portsmouth

No permanent impacts are proposed in Portsmouth. Adjustment of the workpads during the amendment review resulted in the Project avoiding all temporary impacts in Portsmouth.

Direct Stream Impacts

Direct permanent impacts to streams have been avoided, with all structures located in upland or wetland areas. Direct temporary impacts to streams total 568 square feet (221 linear feet) (see Table 3). The majority of streams will be crossed using temporary mat bridges, with matting placed parallel to, but outside of each bank, to serve as bridge supports/abutments, and other matting placed perpendicularly on top of these to bridge the stream. Erosion controls such as bark mulch or silt socks will be placed adjacent to the timber mats serving as bridge supports to minimize soil disturbance and prevent sediment from entering the stream. Two streams are located within work pad areas, and may need temporary culverts during construction activities. Temporary culverts will be sized based on appropriate guidelines to accommodate flows. These areas will be inspected and maintained throughout construction by an Environmental Monitor and the temporary culverts will be removed when no longer needed.

Additionally, two perennial streams, including College Brook (DS74) in Durham and an unnamed stream (NS107) in Newington, are proposed to be crossed with an open trench associated underground line construction near UNH and the Frink Farm, respectively. A short section of each stream will be temporarily relocated using coffer dams to divert water around the impact area during construction. The underground electrical conduit will be installed and the impacted portions of the channels will be reconstructed with native material and stream flow will be restored to its original channel. The areas will be stabilized as needed to support the disturbed banks.

Table 3. Proposed stream impacts by town and flow regime with proposed crossing type

Stream ID	Stream Type	Name	Temp. Impact (SF)	Temp. Impact (LF)	Crossing Type
Durham					
DS8	Ephemeral		0	0	Mat Bridge
DS32	Intermittent		0	0	Mat Bridge
DS34	Ephemeral		0	0	Mat Bridge
DS35	Perennial	Beaudette Brook	0	0	Mat Bridge
DS39	Perennial		207	68	Temp. Culvert
DS46	Perennial	LaRoche Brook	0	0	Mat Bridge
DS51	Perennial		20	10	Temp. Culvert
DS60	Perennial	LaRoche Brook	0	0	Mat Bridge
D061	Perennial		0	0	Mat Bridge
DS74	Perennial	College Brook	147	49	Diversion, Trench & Mat Bridge
DS92	Intermittent		0	0	Mat Bridge
		<i>Subtotal:</i>	374	127	

Stream ID	Stream Type	Name	Temp. Impact (SF)	Temp. Impact (LF)	Crossing Type
Newington					
NS8	Intermittent		0	0	Mat Bridge
NS14	Ephemeral		0	0	Mat Bridge
NS36	Ephemeral		45	45	Temp. Culvert
NS50	Intermittent		0	0	Mat Bridge
NS107	Perennial		149	49	Diversion, Trench & Mat Bridge
		<i>Subtotal:</i>	<i>194</i>	<i>94</i>	
		Total:	568	221	

Secondary Wetland and Stream Impacts

Secondary impacts include wetland conversion from a forested canopy to scrub-shrub and emergent due to tree removal within wetlands and upland stream buffer tree removal within 100 feet of perennial streams, 50 feet of intermittent streams and 25 feet of ephemeral streams.

The majority of the existing corridor is 100 feet wide; however the width of currently cleared and regularly maintained areas vary widely from nearly the entire 100 feet width to as narrow as 30 feet. To safely accommodate the proposed transmission line while meeting the applicable clearances for 115kV and the co-located distribution lines, the entire corridor will need to be cleared of target species to 100 feet in width. Capable species are those woody (tree) species that are capable of growing to a height that could pose a risk to the structures and conductor if they were to fall or come in contact with the conductor. Lower growing shrubs and herbaceous vegetation will not be cleared as they will not grow up to a height that could endanger the line. Minimum clearances from all vegetation must be maintained, and routine maintenance clearing according to PSNH's vegetation clearing procedures and practices is an important component of the SRP operation³.

Wetland areas within the surveyed tree line boundary were quantified within each town (Table 4). Temporary access routes were also established to facilitate the efficient removal of target species. The access roads in wetlands will consist of 16-foot wide timber mat roads, as necessary. Cleared wetlands will not be stumped or grubbed and PSNH will consult with individual landowners on the management of cut trees. The remaining logs and slash will be removed from wetlands. Woody material will be either chipped or diced and windrowed in uplands or removed from the ROW. Chips generated from the tree clearing may be utilized for

³ Northeast Utilities, 2013. *Vegetation Clearing Procedures and Practices for Transmission Line Sections*. OTRM 230. Rev. 2 8/19/2013.

erosion control purposes. At the discretion of the environmental monitor, some woody material may be left in wetlands to avoid physical impacts to the wetland that would result from removing the wood.

Table 4. Forested wetland conversion by town

	Wetland Conversion (SF)	Wetland Conversion (acres)
Madbury	2,072	0.05
Durham	216,621	4.97
Newington	76,726	1.76
Portsmouth	11,305	0.26
Total (SF):	306,724	7.04

Stream buffers function to protect the riparian areas of streams from sedimentation by trapping runoff, erosion by binding the soils near and along streambanks, and providing shade to keep water cool and for cover, plus other habitat benefits for wildlife and aquatic organisms. Tree removal within wetland areas near streams is included in the forested wetland conversion discussed above (Table 4). Proposed tree clearing of upland areas within 100 feet of perennial streams, 50 feet of intermittent streams, and 25 feet of ephemeral streams were quantified based on agency recommendations (Table 5). Cleared areas within these buffers will not be stumped or grubbed and ground disturbances will be limited to those associated with the logging equipment. Additionally, low-growing native shrubs and other species common within riparian buffers will remain. Over time, other shrub and low-growing woody species will colonize these areas helping to enhance and restore these important functions.

Table 5. Upland stream buffer clearing by town

	Perennial Stream Buffer (SF)	Intermittent Stream Buffer (SF)	Ephemeral Stream Buffer (SF)	Total (SF)
Madbury	7,383	0	0	7,383
Durham	53,324	11,452	4,221	68,997
Newington	5,010	4,691	1,119	10,820
Portsmouth	0	0	0	0
Total (SF):	65,717	16,143	5,340	87,200
Total (Acres):	1.51	0.37	0.12	2.00

Vernal Pool Impacts

At the Flynn Pit, the reclassification of the water body as a vernal pool results in an impact to the vernal pool envelope immediately adjacent to the pool; there are no direct impacts to the ponded area itself. The vernal pool envelope is defined by the US Army Corps of Engineers as

a 100-foot band immediately adjacent to the high water mark of the pool to provide shade to the vernal pool and peripheral habitat for amphibians metamorphosing to terrestrial conditions. The proposed underground cable will result in temporary impacts to 7,377 square feet in the vernal pool envelope, of which all will be restored and allowed to revegetate with native species, although a 25-foot wide permanent easement corridor will be periodically mown to maintain access to the underground cable.

Effects on Wetland Functions and Values

Permanent impacts to wetlands and streams were avoided and minimized wherever possible. The remaining unavoidable permanent impacts to terrestrial (palustrine) wetlands are relatively minor in extent (778 SF) and distributed across 26 structures in 24 wetlands. Table 6 summarizes the total proposed permanent impact to each principal wetland function or value in each town. These data do not include functions or values that a wetland is classified as suitable for, as the wetland was not observed performing this function or value within or immediately adjacent to the ROW area. Additionally, because wetlands can have multiple principal functions or values, proposed permanent impacts to a given function or value will exceed the total permanent impact to each given wetland. The functions most commonly associated with the permanently impacted wetlands include groundwater discharge, flood flow alteration, production export, sediment/toxicant retention and wildlife habitat. The small footprint of the new transmission line structures is not expected to affect the existing wetland functions or values. The impacted wetland areas are primarily located within an existing electric corridor and are already subject to periodic maintenance including clearing and other repair work. Temporary impacts are anticipated to have minimal adverse effects on the functions and values associated with the impacted wetland systems. Applicable construction BMPs, on-site monitoring, and restoration of temporarily impacted areas according to standards and based on agency recommendations will be employed (Section 4.0).

Table 6. Permanent impacts to principal functions and values for wetlands in each town.

Town	Groundwater Discharge	Floodflow Alteration	Fish/Shellfish	Sediment/Toxicant Retention	Nutrient Removal	Production Export	Shoreline/Sediment Stabil.	Wildlife Habitat	Recreation	Education/Scientific	Uniqueness/Heritage	Visual Quality/Heritage	RTE Habitat
Madbury	199	199	199	0	0	199	199	199	0	199	0	199	0
Durham	106	3,550	3,550	3,550	0	3,556	0	3,609	3,550	3,550	3,550	3,570	0
Newington	316	1,979	1,786	1,939	153	1,959	0	1,836	1,786	1,786	1,786	1,786	0
Portsmouth	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	621	5,728	5,535	5,489	153	5,714	199	5,644	5,336	5,535	5,336	5,555	0

Tidal Buffer Zone (TBZ) Impacts

The amended design does not change the TBZ impacts described in the original WPA application.

7. Mitigation Narrative

Permanent and secondary impacts that are unavoidable due to safety, engineering, or landownership issues or constraints will be mitigated through compensatory mitigation.

The mitigation plan was developed in accordance with the New Hampshire Wetland Rules (Env-Wt 800) and federal regulatory rules for mitigation in New England under Section 404 of the Clean Water Act (40 CFR Part 230). It incorporates views of state and regional federal regulators with the NHDES Wetlands Bureau, USACE, the US EPA, NHFG, and USFWS per pre-application meeting discussions, as recorded in meeting and phone conversation notes.

Compensatory Wetland Mitigation Narrative

Compensatory mitigation is proposed for unavoidable impacts to permanent wetland fill, and conversion of forested wetlands and stream buffers as a result of tree clearing. The first steps in mitigating wetland impacts are to avoid and minimize impacts. This has been a key component of the design for SRP project. The Project design team has worked with engineers and natural resource scientists to make design changes in order to avoid and minimize wetland impacts wherever possible.

Permanent direct wetland impacts are below the NHDES threshold for mitigation (10,000 SF of permanent wetland impact). Secondary impacts due to tree removal are in accordance with applicable U.S. Army Corps of Engineers ("USACE") regulations and guidance, however, compensatory mitigation is proposed for direct and secondary Project impacts to wetlands and stream buffers.

SRP wetland resource impacts are currently calculated as 5,336 square feet of permanent estuarine impact, 778 square feet of permanent terrestrial wetland impact, 306,724 square feet of forested wetland conversion and 87,200 square feet of upland stream buffer clearing. Direct temporary impacts to streams total 568 square feet (221 linear feet). No direct impacts to vernal pools occur, but temporary impacts (7,377 square feet) will occur within the 100-foot vernal pool envelope of a vernal pool in Newington. A qualitative assessment of 13 wetland functions and values using the USACE Highway Methodology found that, while multiple functions were provided to some degree by most wetlands, the principal functions were the distinguishing features among the wetland types. The most common principal functions include: Groundwater Recharge/Discharge, Wildlife Habitat, Production Export, Sediment/Toxicant/Pathogen Retention, Flood flow Alteration and Nutrient Retention.

Because of the linear nature of the Project and its wetland resource impacts, high value within-project mitigation would be difficult. The Project includes four towns, multiple watersheds and a variety of freshwater and estuarine resources. During agency pre-application meetings, NHDES and USACE agreed that in-lieu fee payment into the State's Aquatic Resource Mitigation fund was appropriate compensatory mitigation for a linear

project such as the SRP. Mitigation ratios were applied to these anticipated impacts in accordance with the *New England Army Corps of Engineers Mitigation Guidance* document and in coordination with the USACE and NHDES.

Calculations for payment into the In-Lieu Fee program based on the types and extent of wetland impacts by town are shown in Table 7. The dollar value shown in Table 7 may change during the review process with NHDES and USACE should design modifications result in changes in wetland impacts. Note that the calculated ARM Fund Payment has increased by \$8,479.27 over the original Application value to a total of \$318,450.38 following the modifications to the design included in this amended permit application filing. Although wetland impacts declined overall as a result of the amended design, the updated values for the 2016 Aquatic Resource Mitigation equalized values increased for most of the towns and resulted in the increased ARM fund payment.

Since the SRP SEC permit application was submitted on April 12, 2016, the Towns of Durham and Newington have developed permittee-responsible mitigation projects, summarized below. Both concepts have merit for compensation for different aspects of wetland resource impacts by the SRP if the regulatory agencies concur.

Durham - Wagon Hill Farm

Introduction and Site Description

The Town of Durham has proposed a shoreline stabilization project to reduce the amount of erosion from the Wagon Hill Farm shoreline bordering the Great Bay Estuary and the Oyster River and restore salt marsh that has already eroded. Wagon Hill Farm is Town-owned conservation land consisting of 139 acres with 1,100 feet of tidal frontage on the Little Bay, Oyster River and Smith Creek, and 8.5 acres of tidal and freshwater wetlands. The project proposes to stabilize a portion of the existing eroded shoreline, which is partially the result of uncontrolled foot and pet traffic along the shoreline. The erosion been exacerbated by rising sea level; wind, wave and ice action; and shading from mature trees on the bank. This erosion is continuing to degrade shoreline and salt marsh habitats and has negative impacts on wildlife, shellfish, and fish habitats. The erosion reduction plan proposes to stabilize and restore the shoreline using a living shoreline concept, as well as measures to halt foot traffic in the sensitive areas by re-designing nearby walking paths to discourage off-path travel, using fences and viewing platforms on the adjacent upland, and installing clear signage along the shoreline area.

Table 7. New Hampshire Aquatic Resource Mitigation (ARM) Fund Payment Calculation for Permanent and Secondary Wetland Impacts

Town	A: Secondary Impact: Forested Wetland Conversion (SF)	A1: Conversion Mitigation Area (15% of total area A)(SF)	B: Secondary Impact: Stream Buffer Clearing (SF)	B1: Conversion Mitigation Area (15% of total area B)(SF)	C: Permanent Impacts (SF)	Total Impacts for Mitigation by Town (SF) (Sum A1+B1+C)	ARM Payment (from NH DES ARM Fund Calculator by Town) ⁴ (USD)
Madbury	2,072	311	7,383	1,107	199	1,617	\$6,501.15
Durham (Freshwater)	216,621	32,493	68,997	10,350	203	43,046	\$192,471.01
Durham (Tidal)	-	-	-	-	3,550	3,550	\$31,746.14
Newington (Freshwater)	76,726	11,509	10,820	1,623	376	13,508	\$62,599.05
Newington (Tidal)	-	-	-	-	1,786	1,786	\$16,553.44
Portsmouth	11,305	1,696	0	0	0	1,696	\$8,579.60
Total:	306,724	46,009	87,200	13,080	6,114	65,203	\$318,450.38

⁴ <http://des.nh.gov/organization/divisions/water/wetlands/wmp/>; ARM Fund Calculator Downloaded 8-31-16

Proposed Project

There are two primary objectives for this project: one) design and build a new shoreline that has both structural and biological elements, a living shoreline, that will minimize erosion, and two) re-establish the degraded salt marsh to further protect the shoreline. The resulting stabilized and restored shoreline will help to protect the water quality and aquatic habitats of the Oyster River and the Great Bay Estuary including the adjacent Salt Marsh and Sparsely Vegetated Intertidal systems, both of which are Exemplary Natural Communities documented by NHHNB. Preliminary estimates suggest that approximately 10,000 square feet of salt marsh, plus approximately 1,100 linear feet of adjacent shoreline could be restored. The Town of Durham has partnered with University of New Hampshire coastal ecologists (Dr. David Burdick and Dr. Greg Moore) and coastal engineer (Dr. Tom Ballestero) and DES Coastal Program staff (Kirsten Howard and Kevin Lucey) to secure funding, collect baseline data, and design the living shoreline solution. This solution will likely include a combination of nearshore deflectors and energy dissipaters to protect against wave and ice action, enhancement of the existing salt marsh, and restoration of salt marsh previously lost to erosion, as well as protection of an upland area preserved for marsh migration as sea level rises. A 5-year monitoring program is proposed to study and assess the results of the project. Performance criteria will be established for evaluating the project with respect to the primary objectives (e.g., minimizing erosion and salt marsh development). Erosion and vegetation development criteria will be based on current erosion rates, salt marsh conditions and the design that is chosen for the site. The partnership between the town, UNH and DES will bring innovative techniques for addressing shoreline erosion and protection from human-caused destabilization. A successful project would serve as an example solution for addressing similar erosion problems elsewhere in the Great Bay Estuary. The details of the University of New Hampshire proposal are provided in Appendix B of Natural Resource Impact Assessment (Appendix B).

SRP Mitigation Proposal

The Wagon Hill Farm shoreline stabilization project provides the opportunity for the SRP to compensate for unavoidable wetland impacts in Durham. These impacts include approximately 778 square feet of permanent impact caused by SRP structures in freshwater wetlands, up to 3,550 square feet of permanent impact from concrete mattresses on tidal flats, and conversion of forested wetlands and stream buffers as a result of tree removal within the SRP project corridor. The shoreline stabilization project at Wagon Hill Farm will restore deteriorated or fully eroded salt marsh, and will reduce the loss of shoreline habitats and the associated sediment loading into critical estuarine habitats. Direct functional benefits to wetland habitats will include restoration and enhancement of Sediment and Shoreline Stabilization, Wildlife Habitat, Fish and Shellfish Habitat, and Production Export functions.

The Wagon Hill Farm project has been divided into phases for funding sources and milestones as shown on the attached schedule: Data Collection, Permitting, Engineering and Design, Construction, and Monitoring (see Appendix B of Natural Resource Impact Assessment (Appendix B)). Data collection and conceptual design under Engineering and Design are

currently underway and are being funded by a matching grant from the DES Coastal Program and Durham (\$40,000). These tasks are expected to be complete by early 2017. The Permitting and remaining Engineering and Design costs have been funded with a second matching grant from DES Coastal Program and town monies for \$42,500. Completion of these tasks is scheduled for mid-2017.

The Construction, Monitoring, and Maintenance components are broken into two phases: Phase 1 is proposed for 2017 and will restore 700 linear feet of shoreline and approximately 10,000 square feet of salt marsh; Phase 2 is projected for 2018 based on the results of Phase 1 and will restore an additional 410 linear feet of eroding shoreline and potentially additional salt marsh. The total cost for construction, 5 years of monitoring and maintenance is currently estimated as \$200,000 for Phase 1, and \$175,000 for Phase 2 for a total of \$375,000. Final costs will vary depending on the final design. The costs for construction, monitoring and maintenance will be funded through a mix of money from the Lois Brown Trust, the Town of Durham general fund, and the SRP compensatory mitigation contribution for unavoidable wetland resource impacts in the town. The Lois Brown Trust has up to \$100,000 available for this project. The Town of Durham voted to approve up to \$84,000 for this project as part of the 2016 annual budget, pending regulatory permit approval for the PSNH contribution. This money will presumably be available in 2017. PSNH proposes to contribute the dollars calculated for the In-Lieu Fee contribution for wetland impacts in Durham towards construction costs. Under the current amended proposal, the value of that contribution is approximately \$224,000, although that may change during final design and the SEC permitting process. Table 8 depicts the cost allocation by contributor for construction.

Table 8. Cost allocation by contributing partner for construction of the Wagon Hill Farm Shoreline Stabilization Project.

Contributing Partner	Amount
Lois Brown Trust	\$100,000
Town of Durham	\$51,000
PSNH	\$224,000
Total	\$375,000

Newington Conservation Easement

Introduction and Site Description

The Newington Conservation Commission is pursuing a 10- acre conservation easement on a 13-acre parcel on Old Post Road (Map 17 Lot 15) that borders an existing conservation parcel and encompasses a section of the Knights Brook Prime wetland (Figure B-1 in Appendix C of Natural Resource Impact Assessment (Appendix B)). PSNH is working with the Town of Newington to develop a permittee-responsible compensatory mitigation project that would

offset the wetland functional impacts of the Seacoast Reliability Project, and meet the town's goal of protecting this valuable parcel for wetland and wildlife habitat.

The Knights Brook system has been a top priority for conservation in Newington, and is listed as such in their 2009 Master Plan. The 10 acres proposed for easement support approximately 3.7 acres of wetland including a 200-foot section of Knights Brook, several springs, forested wetlands, shrub wetlands, wet meadow, and emergent marsh. The adjacent uplands are a mix of mowed fields and upland forest. A more detailed description of the habitats on site is provided in the Knights Brook Watershed Protection ARM Fund Pre-Proposal in Appendix C of Natural Resource Impact Assessment (Appendix B).

The landowners are retaining 3 acres of upland which contain their house, gardens and most outbuildings. They want to continue to maintain and use a set of walking paths through the easement lands. The walking paths are mowed grasses in the fields and a mix of cleared ground and bark mulch in the woodlands. Several wetland crossings have boardwalks and low bridges that were permitted in 2008.

A large portion of the parcel is ranked as Tier 1 habitat (Highest Ranked Habitat in NH) under the 2015 Wildlife Action Plan, with Knights Brook and its wetlands ranked as Supporting Landscape (Figure B-2). The Tier 1 ranking is assigned to the mowed fields, in recognition of their habitat value for a number of bird species with declining populations in NH. The landowners have stated their intention to continue mowing the fields under the conservation easement.

The parcel is adjacent to, or in close proximity to, existing protected lands along the Knights Brook corridor totaling approximately 100 acres (Figure B-1). These include a 38-acre parcel (Map 17, Lot 8) under an agricultural easement that is predominantly hay fields and pasture, and contains considerable riparian habitat and a tributary to Knights Brook. Abutting the proposed parcel is a 36-acre conservation easement (Map 16, Lot 8) that contains a mix of wetland and forested upland and approximately 1,600 linear feet of Knights Brook. North of, and adjacent to, the 36-acre lot is a 26-acre parcel owned by the Town (Map 10, Lot 14), also under a conservation easement. This parcel abuts approximately 700 linear feet of Knights Brook and protects its riparian wetland as well as additional upland buffer. The acquisition of a conservation easement on the proposed parcel would increase the size of this block of protected lands, which also increases its value as watershed protection and wildlife habitat.

Project Status

With the help of the Rockingham County Conservation District, the Newington Conservation Commission (NCC) submitted an ARM Fund pre-proposal on April 22, 2016, to secure additional funds for the purchase of the conservation easement (Appendix C of Natural Resource Impact Assessment (Appendix B)). The DES response indicated that the project needs to develop a functions and values assessment, a stewardship plan that addresses the use of the existing trails, puts limits on construction of new trails, and creates vegetative buffers to protect

aquatic habitat. Since that time, the NCC has gotten a formal appraisal of the value of the easement, a full functions and values assessment, and is currently negotiating the terms of the easement with the landowners using the DES conservation easement template. This easement commits the landowners to no new trail construction and limits the use of the existing trails for their private purposes only.

The DES had originally requested that a natural vegetative buffer be restored along the edges of all wetlands to protect water quality and wildlife habitat. After reviewing the Tier 1 designation of the mowed fields, DES has agreed that the value of the fields and wet meadow outweighs the benefits of the natural buffer along most of the wetlands. DES is requesting that a natural buffer along the wetland edge on the western edge of the mowed fields to protect the wetlands bordering Knights Brook. The landowners have agreed to allow a 100-foot natural buffer to regenerate in that area, although their footpath will remain. A Letter of Intent was signed between the landowner and the NCC, dated September 1, to commit to the purchase of the conservation easement (Appendix C of Natural Resource Impact Assessment (Appendix B)). A draft of the easement is also provided in Appendix C of Natural Resource Impact Assessment (Appendix B). The NCC will be the easement holder and has committed to annual monitoring to ensure the terms of the easement are maintained.

SPR Mitigation Proposal

The Newington Conservation Easement project provides the opportunity for the SRP to compensate Newington for unavoidable permanent impacts caused by SRP structures in freshwater wetlands (approximately 778 square feet), up to 1,800 square feet of permanent impact from concrete mattresses on tidal flats and rocky shore, and conversion of forested wetlands and stream buffers as a result of tree removal within the SRP project corridor. Placing a conservation easement on this parcel will protect a section of Knights Brook and its Prime Wetland, and will enlarge an existing protected block of habitat in a section of town with development potential. It will also narrow a gap in protection between two existing conservation easements. Direct functional benefits to wetland habitats will include protection and enhancement of Groundwater Discharge, Floodflow Alteration, Shoreline Stabilization, Sediment/Toxicant Removal, Nutrient Removal, Wildlife Habitat, and Production Export functions.

The 2016 appraisal value of the conservation easement is \$260,000. PSNH proposes to contribute the dollars calculated for the In-Lieu Fee contribution for wetland impacts in Newington towards the purchase of the easement. Under the current amended proposal, the value of that contribution is approximately \$79,000, although that may change during final design and the SEC permitting process. The NCC has committed \$100,000 from their conservation fund, and will request the remaining monies (estimated as \$81,000) to be raised at through a special warrant article at the 2017 Town Meeting. Table 9 depicts the cost allocation by contributor for purchase of the easement.

Table 9. Cost allocation by contributing partners for the Newington Conservation Easement Acquisition.

Contributing Partner	Amount
Newington Conservation Commission Fund	\$100,000
Town of Newington*	\$81,000
PSNH	\$79,000
Total	\$260,000

*To be requested as a warrant article in the 2017 Town Meeting.

In-Lieu Fee Reversion

PSNH will continue to work with the applicable parties to develop a mitigation package that will be acceptable to NHDES and USACE. In the event that a town proposal does not come to fruition, or develop within an acceptable schedule for the agencies, PSNH agrees that the SRP compensatory mitigation funds will revert to the State In-Lieu Fee program to be dispersed by DES under the general Aquatic Resource Mitigation Fund grant program for the Salmon Falls-Piscatqua Rivers Service Area.

9. NH Programmatic General Permit (PGP) Requirements

U.S. Army Corps of Engineers New Hampshire PGP Appendix B—Corps Secondary Impacts Checklist

The only change in the Corps Secondary Checklist due to the amendment was updated information for historic resources (Section 5).

5. Historic/Archaeological Resources

Coordination with NH Division of Historic Resources (NHDHR) has been ongoing throughout the amendment process. The new underground segments were included in the Phase I-A archeological survey and the results of that survey apply equally to the redesigned route. Since that time, a Phase I-B archeological survey has also been completed. The results of the study are that archeological resources are absent in 26 of the 28 Phase 1-A locations. For those locations, no further survey is recommended and archeological sensitivity is no longer assigned. For the remaining two sites, the Project's archeological consultant has recommended one site be considered as potentially eligible for listing on the National Register of Historic Places and that impact to this site should be avoided. The Project will avoid direct impacts to the cellar hole and employ matting or capping to protect adjacent archeological resources. The Project's archeological consultant has also recommended that the second site, also in Durham, be considered not eligible for listing on the National Register of Historic Places. Therefore, no further survey is recommended for this second site. The archeologic Phase 1-B report was filed with NHDHR on September 28, 2016.

Changes to the Project design have further minimized or eliminated the effects of the Project on two properties: the Newington Center Historic District ("Historic District" or "District") and the Pickering-Rowe House. With the new underground design, the transmission line will be sited underground at the western edge of the Historic District and will run underground for its entire length. The transition structure to the west will be located in a wooded area at the very edge of the boundary of the Frink Farm parcel. It will be visible within the District only by looking down the transmission right-of-way (i.e., west along the existing right-of-way away from the district) and from the abutting public roadway (Nimble Hill Road). The transition structure to the east will be located in a wooded area approximately 1,200 feet east of the district. Furthermore, as part of the Project, PSNH will remove the existing 34.5 kV distribution line that currently crosses the Newington Center Historic District and travels across the Frink Farm. This, in combination with the new underground design, virtually eliminates potential visual impacts to the Historic District, and it means that the Project will not have an adverse effect on the District. Therefore, no additional mitigation measures are necessary relative to this resource.

Because of the new underground design at the Historic District, the transmission line will also not be visible in significant views from the Pickering-Rowe House. The one overhead transmission structure that was to be located in the view from the Pickering-Rowe House toward the Newington Center Historic District is no longer part of the design. This will eliminate any effects to the historic house and no additional mitigation measures will be necessary.

16. Plans (Env-Wt 501.02, Chapter Env-Wt 900)

Detailed plans depicting amended wetland impacts are included on the Environmental Maps (see also SEC Appendix 2(a)).

17. Appendices

Appendix A: Natural Resource Existing Condition Report

See Appendix 7 from original SEC Application and Appendix 7(a) of this Amended SEC Application

Appendix B: Natural Resource Impact Assessment

See Appendix 34 from original SEC Application and Appendix 34(a) of this Amended SEC Application